SEQUENCE LISTING

<110> McBride, Kevin
Stalker, David M.
Pear, Julie
Perez-Grau, Luis

<120> COTTON FIBER TRANSCRIPTIONAL FACTORS

<130> CGNE.115.01US

<140> 08/984,099
<141> 1997-12-03

<150> 08/480,178
<151> 1995-06-07

<160> 18

<170> PatentIn Ver. 2.0

<210> 1
<211> 967
<212> DNA
<213> Gossypium Hirsutum

<400> 1
ctttctattt ggttaaccat ggctcataac tttcgtcatc ctttcttcct tttccaactt 60

ttactcatta ctgtctcact aatgatcggt agccacaccg tctcgtcagc ggctcgacat 120

ttattccaca cacaaacaac ctcatcagag ctgccacaat tggcttcaaa atacgaaaag 180

cacgaagagt ctgaatacaa acagccaaaa tatcatgaag agtacccaaa acatgagaag 240

cctgaaatgt acaaggagga aaaacaaaaa ccctgcaaac atcatgaaga gtaccacgag 300

tcacgcgaat cgaaggagca cgaagagtac gataaagaaa aacccgattt ccccaaatgg 360

gaaaagccta aagagcacga gaaacacgaa gtcgaatatc cgaaaatacc cgagtacaag 420

gacaaacaag atgagaataa gaaacataaa gatgaagagt gccaggagtc acacgaatcg 480

aaagagcacg aagagtacga gaaagaaaaa cccgatttcc ccaaatggga aaagcctaaa 540

gggcacgaga aacataaagc cgaatatccg aaaatacctg agtgcaagga aaaactagat 600

gaggataagg aacataaaca tgagttccca aagcatgaaa aagaagagga gaagaaacct 660

44

gagaaaggca tagtaccctg agtgggttaa aatgcctgaa tggccgaagt ccatgtttac 720

tcagtctggc tcgagcacta agccttaagc catatgacac tggtgcatgt gccatcatca 780

tgcagtaatt tcatgggata ttgtaattat attgttaata aaaaagatgg tgagtgggaa 840

atgtgtgtgt gcattcatcc atgagcaatg ctgaatctct ttgcatgcat agagattctg 900

aatggttata gtttatgtta tatcgtttgt tctagtgaaa ttaattttga atgttgtatg 960

taatgtt 967

<210> 2
<211> 967
<212> DNA
<213> Gossypium Hirsutum

<220>
<221> CDS
<222> (1)..(966)

<400> 2

```
ctt tct att tgg tta acc atg gct cat aac ttt cgt cat cct ttc ttc   48
Leu Ser Ile Trp Leu Thr Met Ala His Asn Phe Arg His Pro Phe Phe
  1               5                  10                  15

ctt ttc caa ctt tta ctc att act gtc tca cta atg atc ggt agc cac   96
Leu Phe Gln Leu Leu Leu Ile Thr Val Ser Leu Met Ile Gly Ser His
             20                  25                  30

acc gtc tcg tca gcg gct cga cat tta ttc cac aca caa aca acc tca   144
Thr Val Ser Ser Ala Ala Arg His Leu Phe His Thr Gln Thr Thr Ser
         35                  40                  45

tca gag ctg cca caa ttg gct tca aaa tac gaa aag cac gaa gag tct   192
Ser Glu Leu Pro Gln Leu Ala Ser Lys Tyr Glu Lys His Glu Glu Ser
     50                  55                  60

gaa tac aaa cag cca aaa tat cat gaa gag tac cca aaa cat gag aag   240
Glu Tyr Lys Gln Pro Lys Tyr His Glu Glu Tyr Pro Lys His Glu Lys
 65                  70                  75                  80

cct gaa atg tac aag gag gaa aaa caa aaa ccc tgc aaa cat cat gaa   288
Pro Glu Met Tyr Lys Glu Glu Lys Gln Lys Pro Cys Lys His His Glu
                 85                  90                  95
```


45

```
gag tac cac gag tca cgc gaa tcg aag gag cac gaa gag tac gat aaa   336
Glu Tyr His Glu Ser Arg Glu Ser Lys Glu His Glu Glu Tyr Asp Lys
            100                 105                 110

gaa aaa ccc gat ttc ccc aaa tgg gaa aag cct aaa gag cac gag aaa   384
Glu Lys Pro Asp Phe Pro Lys Trp Glu Lys Pro Lys Glu His Glu Lys
        115                 120                 125

cac gaa gtc gaa tat ccg aaa ata ccc gag tac aag gac aaa caa gat   432
His Glu Val Glu Tyr Pro Lys Ile Pro Glu Tyr Lys Asp Lys Gln Asp
    130                 135                 140

gag aat aag aaa cat aaa gat gaa gag tgc cag gag tca cac gaa tcg   480
Glu Asn Lys Lys His Lys Asp Glu Glu Cys Gln Glu Ser His Glu Ser
145                 150                 155                 160

aaa gag cac gaa gag tac gag aaa gaa aaa ccc gat ttc ccc aaa tgg   528
Lys Glu His Glu Glu Tyr Glu Lys Glu Lys Pro Asp Phe Pro Lys Trp
                165                 170                 175

gaa aag cct aaa ggg cac gag aaa cat aaa gcc gaa tat ccg aaa ata   576
Glu Lys Pro Lys Gly His Glu Lys His Lys Ala Glu Tyr Pro Lys Ile
            180                 185                 190

cct gag tgc aag gaa aaa cta gat gag gat aag gaa cat aaa cat gag   624
Pro Glu Cys Lys Glu Lys Leu Asp Glu Asp Lys Glu His Lys His Glu
        195                 200                 205

ttc cca aag cat gaa aaa gaa gag gag aag aaa cct gag aaa ggc ata   672
Phe Pro Lys His Glu Lys Glu Glu Glu Lys Lys Pro Glu Lys Gly Ile
    210                 215                 220

gta ccc tga gtg ggt taa aat gcc tga atg gcc gaa gtc cat gtt tac   720
Val Pro     Val Gly     Asn Ala     Met Ala Glu Val His Val Tyr
225                 230                 235                 240

tca gtc tgg ctc gag cac taa gcc tta agc cat atg aca ctg gtg cat   768
Ser Val Trp Leu Glu His     Ala Leu Ser His Met Thr Leu Val His
                245                 250                 255

gtg cca tca tca tgc agt aat ttc atg gga tat tgt aat tat att gtt   816
Val Pro Ser Ser Cys Ser Asn Phe Met Gly Tyr Cys Asn Tyr Ile Val
            260                 265                 270

aat aaa aaa gat ggt gag tgg gaa atg tgt gtg tgc att cat cca tga   864
Asn Lys Lys Asp Gly Glu Trp Glu Met Cys Val Cys Ile His Pro
        275                 280                 285
```


H6

```
gca atg ctg aat ctc ttt gca tgc ata gag att ctg aat ggt tat agt   912
Ala Met Leu Asn Leu Phe Ala Cys Ile Glu Ile Leu Asn Gly Tyr Ser
    290                 295                 300

tta tgt tat atc gtt tgt tct agt gaa att aat ttt gaa tgt tgt atg   960
Leu Cys Tyr Ile Val Cys Ser Ser Glu Ile Asn Phe Glu Cys Cys Met
305                 310                 315                 320

taa tgt t                                                        967
    Cys
```

<210> 3
<211> 226
<212> PRT
<213> Gossypium Hirsutum

<400> 3

```
Leu Ser Ile Trp Leu Thr Met Ala His Asn Phe Arg His Pro Phe Phe
  1               5                  10                  15

Leu Phe Gln Leu Leu Leu Ile Thr Val Ser Leu Met Ile Gly Ser His
             20                  25                  30

Thr Val Ser Ser Ala Ala Arg His Leu Phe His Thr Gln Thr Thr Ser
         35                  40                  45

Ser Glu Leu Pro Gln Leu Ala Ser Lys Tyr Glu Lys His Glu Glu Ser
     50                  55                  60

Glu Tyr Lys Gln Pro Lys Tyr His Glu Glu Tyr Pro Lys His Glu Lys
 65                  70                  75                  80

Pro Glu Met Tyr Lys Glu Glu Lys Gln Lys Pro Cys Lys His His Glu
                85                  90                  95

Glu Tyr His Glu Ser Arg Glu Ser Lys Glu His Glu Glu Tyr Asp Lys
            100                 105                 110

Glu Lys Pro Asp Phe Pro Lys Trp Glu Lys Pro Lys Glu His Glu Lys
        115                 120                 125

His Glu Val Glu Tyr Pro Lys Ile Pro Glu Tyr Lys Asp Lys Gln Asp
    130                 135                 140

Glu Asn Lys Lys His Lys Asp Glu Glu Cys Gln Glu Ser His Glu Ser
145                 150                 155                 160
```


47

Lys Glu His Glu Glu Tyr Glu Lys Glu Lys Pro Asp Phe Pro Lys Trp
165 170 175

Glu Lys Pro Lys Gly His Glu Lys His Lys Ala Glu Tyr Pro Lys Ile
180 185 190

Pro Glu Cys Lys Glu Lys Leu Asp Glu Asp Lys Glu His Lys His Glu
195 200 205

Phe Pro Lys His Glu Lys Glu Glu Glu Lys Lys Pro Glu Lys Gly Ile
210 215 220

Val Pro
225

<210> 4
<211> 13
<212> PRT
<213> Gossypium Hirsutum

<400> 4
Met Ala Glu Val His Val Tyr Ser Val Trp Leu Glu His
1 5 10

<210> 5
<211> 40
<212> PRT
<213> Gossypium Hirsutum

<400> 5
Ala Leu Ser His Met Thr Leu Val His Val Pro Ser Ser Cys Ser Asn
1 5 10 15

Phe Met Gly Tyr Cys Asn Tyr Ile Val Asn Lys Lys Asp Gly Glu Trp
20 25 30

Glu Met Cys Val Cys Ile His Pro
35 40

<210> 6
<211> 32
<212> PRT
<213> Gossypium Hirsutum

<400> 6

48

Ala Met Leu Asn Leu Phe Ala Cys Ile Glu Ile Leu Asn Gly Tyr Ser
1 5 10 15

Leu Cys Tyr Ile Val Cys Ser Ser Glu Ile Asn Phe Glu Cys Cys Met
20 25 30

<210> 7
<211> 5547
<212> DNA
<213> Gossypium Hirsutum

<400> 7
actaaaggga acaaaagctg gagctccacc gcggtggcgg ccgctctaga actagtggat 60

cccccgtgga ctaaacaaaa catgggaaga tttgctgtaa aaaaataaaa gaagcttact 120

caataacact ttgtgaattg tatacaaaag actcaatgaa aaacaataac tcaatacact 180

ttttttcact gatttacatc ctttatatag gctgaaacta caacaacttt agctaaaaaa 240

ataggataac ctaatagcaa aatcacaatc agatattaaa ccatgatttt agctaaccat 300

ttaacaactt tattgaaact aatttgaata tttcatctgc tgatatgccc aagattttag 360

gccactaacc gatttggtgg tgaactttaa catgtcatgc atttgtaact gtttgaaaca 420

agtttttgc attattttac tatatgaact gtttgattag gttgagttac acactgagct 480

tgtaagctca ctcaaatttt tctaatttct aaggtgatca gcaaacttag gaccgggcgg 540

cgtacgagag ctcggattga ttttctagtt aataaataag acgatttatg tttttaaact 600

attatggact ttttggacta tgtaactgtt tgggacttta tttttgtttt ttatttgctt 660

tttttggatt tagtaattat tatttttaaa ctgcaaaatt atatgttttt acaaactaag 720

tcacagtttt caaaattcca taacttagaa tttttcgctg caaaataaag taatcattta 780

agtgtttttt ctgtaataaa ataaataaat aattttaacg agtattttcc taaaaattgg 840

aaattgattt accaaaatta gtatgtcaaa acacatgttt atatgttaca gggcgatatc 900

gtctaggcaa ataacatcta ggcggggttt ggagtgttac agggcgagtg ggctcatttt 960

gagtaagtat agttagggcc gagttttaga ttgcatattc aaggtcaaag attttgtaaa 1020

cttcgatgaa tgatatgtat gattgtccga ttaacgaaat atgtttttt cttttgtgtg 1080

49

tgttttatct cgtgtgataa gtatatagta tgttttattc caattcttat ggcatgtgac 1140

attgtggcta ttctaattaa attgatttgt tattattgaa atctgatgca tctgttctac 1200

aaagcatgga atctcatgcc tactgctttc tgttaaagat acgattgcaa gtttaacatg 1260

cttactattt tgattttgtc cttgcatgct atgtcacatt acatggggtt gggatgatat 1320

ggtaaggagg aagttttgac agtttaatga tttgcactat ctggtggttt aaccacatat 1380

ttgttatggc atcttgactg cggttatggt ggctcgaccg cccatatctg ttctggaaat 1440

ttatctgtga ctctggtggc attgtctaca attatttgtt ggtgtgtttt ggatggacga 1500

gtcgtgggga actctatttg gtgtgttgcg gagttgggta ggaaattttc gaaaaaaatt 1560

tgcattgtgt ttttctgaaa aatattgcat taacataatc atgcattctc aattttggtc 1620

aattgaacgt tataaaattc tctatgatat cctgatctgt ttattacatt atatgtgttt 1680

atgcttgagt taagtcaaac attgagattc atagctcacc caattattta atcatttcag 1740

gcaatctgca gacttaggat tggatggcgt tcaggagctt ggattggttt tctcacatca 1800

tattttatta aataattatt aattaaaatt tatggacttt tggactgtct gactaatttt 1860

cagaatttta ttttggtttt gggttttgtt gaatttttta gataattatt ttaaatattc 1920

tgcataattt ttctgttatt tgaaaaggat gttcgaattt tttttcaaaa ttgaaacgtt 1980

taagaatttt tactactgca aattcagaat aagtgaattt gtttttttaga aagattaaat 2040

aagttagtat tacgattttt agtttgattt ggtggaaagt aatgtatgtt tttgaacata 2100

attatttgac aataattaag ttttctaggg aataaacgga aatatcttct tctttttttgt 2160

aaaattacta atgcaagaac aaacaacgtt ttggggagca aataatctag ctttaagtag 2220

tcagtgtaac tctcaaaatc tggtcataac ttctaggctg agtttgctgt gctacagtag 2280

taagtctata gaaacttacc tgacaaaacg acatgacgtc agggtcgaat ctacaacttt 2340

tccttttttct tcaattaaca tatggttgat tcaagttccg atctataata atttattacg 2400

atttatcaat ttcaattacc ttatatcatc ctattataaa tataagtcag ttcaattcag 2460

ttttcgaaag ttcccaaaaa ttttgaattt tattaaattt attccctaaa accgaaatag 2520

50

ttatatcttt caaatttaag tttcattttt caatccgatt tcaatttcat ccttttataa 2580

ctctctatta tctataatta cataaatttc aaattaattt tgaaatattt acactttagt 2640

ccctaagttc aaaactataa attttcactt tagaaattaa tcatttttca catctaagca 2700

tcaaatttaa ccaaatgaca caaatttcat gattagttag atcaagcttt tgagtcttca 2760

aaacataaaa attacaaaaa aaaaacaaac ttaaaatcat ttatcaattt gaacaacaaa 2820

gcttggccga atgctaagag cttaaaaatg gcttcttttg tttcttttg ttgcaaacgg 2880

tggagagaag agggaaatga agattgacca tatttttta ttatgtttta acatataata 2940

ttaataattt aatcataatt atactttggt gaatgtgaca gtggggagat acgtaaagta 3000

ttttaacatt atacttttg caagcagttg gctggtctac ccaagagtga tcaaagtttg 3060

agctgccttc aatgagccaa tttttgccca taatggataa aggcaatttg tttagttcaa 3120

ctgctcacag aataatgtta aaatgaaatt aaaataaggt ggcctggtca cacacacaaa 3180

aaaaaactaa tgttggttgg ttgaatttta tattacggaa tgtaatatta tattttaaaa 3240

taaaattatg ttatttagat tcttaatatt ttggagcatt ccatactata atttcgtaac 3300

ataatattaa aatatagtaa tataaagtgt aattaacttt aaattacaag cataatatta 3360

aattttgaat caattaattt ttatttctat tattttaatt aatttagtct attttttcaa 3420

aataaaattt aaatctaaat aaaaataatt tttccttaat gttgaaacaa ctcatgttat 3480

acttcaaaat tataagtatt atatttacct tgatgattta tttattagta tattaattct 3540

gattataatt atggtgggat acaatcgctt tccactaaat attttaacta tgatttataa 3600

atttatttca acatcgtata tttacttatt aatacataat ttatcataat tttatggaaa 3660

ttgagaccaa gaaacattaa gagaacaaat tctataacaa agacaattta gaaaaaaatg 3720

tacttttagg taattttaag tactcttaac caaacacaaa aattcaaatc aaatgaacta 3780

aataagataa tataacatac ggaacatctt acttgtaatc ttacattccc ataattttat 3840

tatgaaaaat aatcttatat tactcgaact aaatgttgtc acaaattatt atctaaataa 3900

agaaaaacac ttaattttta taacattttt tcatatattt gaaagattat attttgtata 3960

51

tttacgtaaa aatatttgac atagattgag caccttctta acataatccc accataagtc 4020

aagtatgtag atgagaaatt ggtacaaaca acgtggggcc aaatcccacc aaaccatctc 4080

tcattctctc ctataaaagg cttgctacac atagacaaca atccacacac aaatacacgt 4140

tcttttcttt ctatttgatt aaccatggct catagcattc gtcacccttt cttccttttc 4200

caacttttac tcataagtgt ctcactagtg accggtagcc acactgtttc ggcagcggct 4260

cgacgtttat tcgagacaca agcaacctca tcagagctcc cacaattggc ttcaaaatac 4320

gaaagcacga gagtctgaat acgaaaagcc agaatacaaa cagccaaagt atcacgaaga 4380

gtactcaaaa cttgagaagc ctgaaatgca aaaggaggaa aaacaaaaac cctgcaaaca 4440

gcatgaagag taccacgagt cacacgaatc aaaggagcaa aaagagtacg agaaagaaaa 4500

tctcgacgaa ttcccccggg cgtcgacggc tagcgaagat cttcgggccc gtcgagcctt 4560

gaatcatatg acactggtgc atgtgccatc atcatgcagt aatttcatgg tatatcgtaa 4620

tatatagtta ataaaaaaga tggtgattgg gaaatgtgtg tgtgcattcc tccatgcact 4680

aatggtgaat ctctttgcat acatagaaat tctaaatggt tatagtttat gttatagtgt 4740

atgttgtagt gaaattaatt ttaaatgttg tatctaatgt taacatcact tggcttgatt 4800

tatgttatgt tatgtatttt actttaatga tattgcatgt attgttaatt taacattgct 4860

tgatcattat actcttctac tattaattat aaatggcact gttttgttta aacttttac 4920

aagttaagac atgtataaat atatgacaat ataattacag gttttagttc aatgttagct 4980

atcttagtat gttattgatg atcttaatta catttaaaca aattccactt aaaattttaa 5040

taaataataa caaataatta ttgtaatata atacattaaa tgcaacaaaa aatgaaataa 5100

ataaaataaa atagcaaata attgttataa tattgtaata taatatgtac catattctta 5160

actgaaatag ggtctaacct ataatcccta aaatttcagt ttaaatattt ttatacctac 5220

catattatta gaactctttt taaatatatt aaaattttaa ttataccaat ttaattaaac 5280

tattaattat cttaactaaa atctaaaatt ttatttaacc tattaataaa ttcctaatta 5340

tcttatctaa tttaaaactc taattatcct aatttaattt aaattcttaa ttatcttaat 5400

52

ttgtaacctc ctccacccag ctagatgctg gacccgaatc cgggagatta catcggccat 5460

tgagatggcg tgatcagggt ttggcgcgcc ggtacccaat tcgccctata gtgagttcgt 5520

attacgcgcg ctcactgcgt ccggttt 5547

<210> 8
<211> 5547
<212> DNA
<213> Gossypium Hirsutum

<220>
<221> CDS
<222> (4164)..(4502)

<400> 8
actaaaggga acaaaagctg gagctccacc gcggtggcgg ccgctctaga actagtggat 60

cccccgtgga ctaaacaaaa catgggaaga tttgctgtaa aaaaataaaa gaagcttact 120

caataacact ttgtgaattg tatacaaaag actcaatgaa aaacaataac tcaatacact 180

ttttttcact gatttacatc ctttatatag gctgaaacta caacaacttt agctaaaaaa 240

ataggataac ctaatagcaa aatcacaatc agatattaaa ccatgatttt agctaaccat 300

ttaacaactt tattgaaact aatttgaata tttcatctgc tgatatgccc aagattttag 360

gccactaacc gatttggtgg tgaactttaa catgtcatgc atttgtaact gtttgaaaca 420

agtttttttgc attattttac tatatgaact gtttgattag gttgagttac acactgagct 480

tgtaagctca ctcaaatttt tctaatttct aaggtgatca gcaaacttag gaccgggcgg 540

cgtacgagag ctcggattga ttttctagtt aataaataag acgatttatg tttttaaact 600

attatggact ttttggacta tgtaactgtt tgggacttta tttttgtttt ttatttgctt 660

tttttggatt tagtaattat tatttttaaa ctgcaaaatt atatgttttt acaaactaag 720

tcacagtttt caaaattcca taacttagaa tttttcgctg caaaataaag taatcattta 780

agtgtttttt ctgtaataaa ataaataaat aattttaacg agtattttcc taaaaattgg 840

aaattgattt accaaaatta gtatgtcaaa acacatgttt atatgttaca gggcgatatc 900

53

gtctaggcaa ataacatcta ggcggggttt ggagtgttac agggcgagtg ggctcatttt 960

gagtaagtat agttagggcc gagttttaga ttgcatattc aaggtcaaag attttgtaaa 1020

cttcgatgaa tgatatgtat gattgtccga ttaacgaaat atgtttttt cttttgtgtg 1080

tgttttatct cgtgtgataa gtatatagta tgttttattc caattcttat ggcatgtgac 1140

attgtggcta ttctaattaa attgatttgt tattattgaa atctgatgca tctgttctac 1200

aaagcatgga atctcatgcc tactgctttc tgttaaagat acgattgcaa gtttaacatg 1260

cttactattt tgattttgtc cttgcatgct atgtcacatt acatggggtt gggatgatat 1320

ggtaaggagg aagttttgac agtttaatga tttgcactat ctggtggttt aaccacatat 1380

ttgttatggc atcttgactg cggttatggt ggctcgaccg cccatatctg ttctggaaat 1440

ttatctgtga ctctggtggc attgtctaca attatttgtt ggtgtgtttt ggatggacga 1500

gtcgtgggga actctatttg gtgtgttgcg gagttgggta ggaaattttc gaaaaaaatt 1560

tgcattgtgt ttttctgaaa aatattgcat taacataatc atgcattctc aattttggtc 1620

aattgaacgt tataaaattc tctatgatat cctgatctgt ttattacatt atatgtgttt 1680

atgcttgagt taagtcaaac attgagattc atagctcacc caattattta atcatttcag 1740

gcaatctgca gacttaggat tggatggcgt tcaggagctt ggattggttt tctcacatca 1800

tattttatta ataattatt aattaaaatt tatggacttt tggactgtct gactaatttt 1860

cagaatttta ttttggtttt gggttttgtt gaatttttta gataattatt ttaaatattc 1920

tgcataattt ttctgttatt tgaaaaggat gttcgaattt tttttcaaaa ttgaaacgtt 1980

taagaatttt tactactgca aattcagaat aagtgaattt gttttttaga aagattaaat 2040

aagttagtat tacgattttt agtttgattt ggtggaaagt aatgtatgtt tttgaacata 2100

attatttgac aataattaag ttttctaggg aataaacgga aatatcttct tctttttttgt 2160

aaaattacta atgcaagaac aaacaacgtt ttggggagca aataatctag ctttaagtag 2220

tcagtgtaac tctcaaaatc tggtcataac ttctaggctg agtttgctgt gctacagtag 2280

taagtctata gaaacttacc tgacaaaacg acatgacgtc agggtcgaat ctacaacttt 2340

54

tccttttttct tcaattaaca tatggttgat tcaagttccg atctataata atttattacg 2400

atttatcaat ttcaattacc ttatatcatc ctattataaa tataagtcag ttcaattcag 2460

ttttcgaaag ttcccaaaaa ttttgaattt tattaaattt attccctaaa accgaaatag 2520

ttatatcttt caaatttaag tttcattttt caatccgatt tcaatttcat ccttttataa 2580

ctctctatta tctataatta cataaatttc aaattaattt tgaaatattt acactttagt 2640

ccctaagttc aaaactataa attttcactt tagaaattaa tcatttttca catctaagca 2700

tcaaatttaa ccaaatgaca caaatttcat gattagttag atcaagcttt tgagtcttca 2760

aaacataaaa attacaaaaa aaaaacaaac ttaaaatcat ttatcaattt gaacaacaaa 2820

gcttggccga atgctaagag cttaaaaatg gcttcttttg tttcttttttg ttgcaaacgg 2880

tggagagaag agggaaatga agattgacca tatttttta ttatgtttta acatataata 2940

ttaataattt aatcataatt atactttggt gaatgtgaca gtggggagat acgtaaagta 3000

ttttaacatt atacttttttg caagcagttg gctggtctac ccaagagtga tcaaagtttg 3060

agctgccttc aatgagccaa tttttgccca taatggataa aggcaatttg tttagttcaa 3120

ctgctcacag aataatgtta aaatgaaatt aaaataaggt ggcctggtca cacacacaaa 3180

aaaaaactaa tgttggttgg ttgaatttta tattacggaa tgtaatatta tattttaaaa 3240

taaaattatg ttatttagat tcttaatatt ttggagcatt ccatactata atttcgtaac 3300

ataatattaa aatatagtaa tataaagtgt aattaacttt aaattacaag cataatatta 3360

aattttgaat caattaattt ttatttctat tattttaatt aatttagtct atttttttcaa 3420

aataaaattt aaatctaaat aaaaataatt tttccttaat gttgaaacaa ctcatgttat 3480

acttcaaaat tataagtatt atatttacct tgatgattta tttattagta tattaattct 3540

gattataatt atggtgggat acaatcgctt tccactaaat attttaacta tgatttataa 3600

atttatttca acatcgtata tttacttatt aatacataat ttatcataat tttatggaaa 3660

ttgagaccaa gaaacattaa gagaacaaat tctataacaa agacaattta gaaaaaaatg 3720

tacttttagg taattttaag tactcttaac caaacacaaa aattcaaatc aaatgaacta 3780

55

```
aataagataa tataacatac ggaacatctt acttgtaatc ttacattccc ataattttat 3840

tatgaaaaat aatcttatat tactcgaact aaatgttgtc acaaattatt atctaaataa 3900

agaaaaacac ttaattttta taacattttt tcatatattt gaaagattat attttgtata 3960

tttacgtaaa aatatttgac atagattgag caccttctta acataatccc accataagtc 4020

aagtatgtag atgagaaatt ggtacaaaca acgtggggcc aaatcccacc aaaccatctc 4080

tcattctctc ctataaaagg cttgctacac atagacaaca atccacacac aaatacacgt 4140

tcttttcttt ctatttgatt aac cat ggc tca tag cat tcg tca ccc ttt ctt 4193
                         His Gly Ser     His Ser Ser Pro Phe Leu
                           1               5                  10

cct ttt cca act ttt act cat aag tgt ctc act agt gac cgg tag cca   4241
Pro Phe Pro Thr Phe Thr His Lys Cys Leu Thr Ser Asp Arg     Pro
                15                  20                  25

cac tgt ttc ggc agc ggc tcg acg ttt att cga gac aca agc aac ctc   4289
His Cys Phe Gly Ser Gly Ser Thr Phe Ile Arg Asp Thr Ser Asn Leu
            30                  35                  40

atc aga gct ccc aca att ggc ttc aaa ata cga aag cac gag agt ctg   4337
Ile Arg Ala Pro Thr Ile Gly Phe Lys Ile Arg Lys His Glu Ser Leu
        45                  50                  55

aat acg aaa agc cag aat aca aac agc caa agt atc acg aag agt act   4385
Asn Thr Lys Ser Gln Asn Thr Asn Ser Gln Ser Ile Thr Lys Ser Thr
    60                  65                  70

caa aac ttg aga agc ctg aaa tgc aaa agg agg aaa aac aaa aac cct   4433
Gln Asn Leu Arg Ser Leu Lys Cys Lys Arg Arg Lys Asn Lys Asn Pro
75                  80                  85                  90

gca aac agc atg aag agt acc acg agt cac acg aat caa agg agc aaa   4481
Ala Asn Ser Met Lys Ser Thr Thr Ser His Thr Asn Gln Arg Ser Lys
                95                  100                 105

aag agt acg aga aag aaa atc tcgacgaatt cccccgggcg tcgacggcta      4532
Lys Ser Thr Arg Lys Lys Ile
            110

gcgaagatct tcgggcccgt cgagccttga atcatatgac actggtgcat gtgccatcat 4592

catgcagtaa tttcatggta tatcgtaata tatagttaat aaaaaagatg gtgattggga 4652
```


54

aatgtgtgtg tgcattcctc catgcactaa tggtgaatct ctttgcatac atagaaattc 4712

taaatggtta tagtttatgt tatagtgtat gttgtagtga aattaatttt aaatgttgta 4772

tctaatgtta acatcacttg gcttgattta tgttatgtta tgtattttac tttaatgata 4832

ttgcatgtat tgttaattta acattgcttg atcattatac tcttctacta ttaattataa 4892

atggcactgt tttgtttaaa ctttttacaa gttaagacat gtataaatat atgacaatat 4952

aattacaggt tttagttcaa tgttagctat cttagtatgt tattgatgat cttaattaca 5012

tttaaacaaa ttccacttaa aattttaata aataataaca aataattatt gtaatataat 5072

acattaaatg caacaaaaaa tgaaataaat aaaataaaat agcaaataat tgttataata 5132

ttgtaatata atatgtacca tattcttaac tgaaataggg tctaacctat aatccctaaa 5192

atttcagttt aaatattttt atacctacca tattattaga actcttttta aatatattaa 5252

aattttaatt ataccaattt aattaaacta ttaattatct taactaaaat ctaaaatttt 5312

atttaaccta ttaataaatt cctaattatc ttatctaatt taaaactcta attatcctaa 5372

tttaatttaa attcttaatt atcttaattt gtaacctcct ccacccagct agatgctgga 5432

cccgaatccg ggagattaca tcggccattg agatggcgtg atcagggttt ggcgcgccgg 5492

tacccaattc gccctatagt gagttcgtat tacgcgcgct cactgcgtcc ggttt 5547

<210> 9
<211> 20
<212> PRT
<213> Gossypium Hirsutum

<400> 9
His Ser Ser Pro Phe Leu Pro Phe Pro Thr Phe Thr His Lys Cys Leu
1 5 10 15

Thr Ser Asp Arg
20

<210> 10
<211> 88
<212> PRT
<213> Gossypium Hirsutum

57

<400> 10

Pro His Cys Phe Gly Ser Gly Ser Thr Phe Ile Arg Asp Thr Ser Asn
1 5 10 15

Leu Ile Arg Ala Pro Thr Ile Gly Phe Lys Ile Arg Lys His Glu Ser
20 25 30

Leu Asn Thr Lys Ser Gln Asn Thr Asn Ser Gln Ser Ile Thr Lys Ser
35 40 45

Thr Gln Asn Leu Arg Ser Leu Lys Cys Lys Arg Arg Lys Asn Lys Asn
50 55 60

Pro Ala Asn Ser Met Lys Ser Thr Thr Ser His Thr Asn Gln Arg Ser
65 70 80

Lys Lys Ser Thr Arg Lys Lys Ile
85

<210> 11
<211> 5518
<212> DNA
<213> Gossypium Hirsutum

<400> 11

actaaaggga acaaaagctg gagctccacc gcggtggcgg ccgctctagg atcccccgtg 60

gactaaacaa aacatgggaa gatttgctgt aaaaaaataa aagaagctta ctcaataaca 120

ctttgtgaat tgtatacaaa agactcaatg aaaaacaata actcaataca ctttttttca 180

ctgatttaca tcctttatat aggctgaaac tacaacaact ttagctaaaa aaataggata 240

acctaatagc aaaatcacaa tcagatatta aaccatgatt ttagctaacc atttaacaac 300

tttattgaaa ctaatttgaa tatttcatct gctgatatgc ccaagatttt aggccactaa 360

ccgatttggt ggtgaacttt aacatgtcat gcatttgtaa ctgtttgaaa caagtttttt 420

gcattatttt actatatgaa ctgtttgatt aggttgagtt acacactgag cttgtaagct 480

cactcaaatt tttctaattt ctaaggtgat cagcaaactt aggaccgggc ggcgtacgag 540

agctcggatt gattttctag ttaataaata agacgattta tgtttttaaa ctattatgga 600

ctttttggac tatgtaactg tttgggactt tatttttgtt ttttatttgc tttttttgga 660

58

tttagtaatt attattttta aactgcaaaa ttatatgttt ttacaaacta agtcacagtt 720

ttcaaaattc cataacttag aatttttcgc tgcaaaataa agtaatcatt taagtgtttt 780

ttctgtaata aaataaataa ataattttaa cgagtatttt cctaaaaatt ggaaattgat 840

ttaccaaaat tagtatgtca aaacacatgt ttatatgtta cagggcgata tcgtctaggc 900

aaataacatc taggcggggt ttggagtgtt acagggcgag tgggctcatt ttgagtaagt 960

atagttaggg ccgagtttta gattgcatat tcaaggtcaa agattttgta aacttcgatg 1020

aatgatatgt atgattgtcc gattaacgaa atatgttttt ttcttttgtg tgtgttttat 1080

ctcgtgtgat aagtatatag tatgttttat tccaattctt atggcatgtg acattgtggc 1140

tattctaatt aaattgattt gttattattg aaatctgatg catctgttct acaaagcatg 1200

gaatctcatg cctactgctt tctgttaaag atacgattgc aagtttaaca tgcttactat 1260

tttgattttg tccttgcatg ctatgtcaca ttacatgggg ttgggatgat atggtaagga 1320

ggaagttttg acagtttaat gatttgcact atctggtggt ttaaccacat atttgttatg 1380

gcatcttgac tgcggttatg gtggctcgac cgcccatatc tgttctggaa atttatctgt 1440

gactctggtg gcattgtcta caattatttg ttggtgtgtt ttggatggac gagtcgtggg 1500

gaactctatt tggtgtgttg cggagttggg taggaaattt tcgaaaaaaa tttgcattgt 1560

gtttttctga aaaatattgc attaacataa tcatgcattc tcaattttgg tcaattgaac 1620

gttataaaat tctctatgat atcctgatct gtttattaca ttatatgtgt ttatgcttga 1680

gttaagtcaa acattgagat tcatagctca cccaattatt taatcatttc aggcaatctg 1740

cagacttagg attggatggc gttcaggagc ttggattggt tttctcacat catattttat 1800

taaataatta ttaattaaaa tttatggact tttggactgt ctgactaatt ttcagaattt 1860

tattttggtt ttgggttttg ttgaattttt tagataatta ttttaaatat tctgcataat 1920

ttttctgtta tttgaaaagg atgttcgaat tttttttcaa aattgaaacg tttaagaatt 1980

tttactactg caaattcaga ataagtgaat ttgtttttta gaaagattaa ataagttagt 2040

attacgattt ttagtttgat ttggtggaaa gtaatgtatg tttttgaaca taattatttg 2100

59

acaataatta agttttctag ggaataaacg gaaatatctt cttctttttt gtaaaattac 2160

taatgcaaga acaaacaacg ttttggggag caaataatct agctttaagt agtcagtgta 2220

actctcaaaa tctggtcata acttctaggc tgagtttgct gtgctacagt agtaagtcta 2280

tagaaactta cctgacaaaa cgacatgacg tcagggtcga atctacaact tttccttttt 2340

cttcaattaa catatggttg attcaagttc cgatctataa taatttatta cgatttatca 2400

atttcaatta ccttatatca tcctattata aatataagtc agttcaattc agttttcgaa 2460

agttcccaaa aattttgaat tttattaaat ttattcccta aaaccgaaat agttatatct 2520

ttcaaattta agtttcattt ttcaatccga tttcaatttc atccttttat aactctctat 2580

tatctataat tacataaatt tcaaattaat tttgaaatat ttacacttta gtccctaagt 2640

tcaaaactat aaattttcac tttagaaatt aatcattttt cacatctaag catcaaattt 2700

aaccaaatga cacaaatttc atgattagtt agatcaagct tttgagtctt caaaacataa 2760

aaattacaaa aaaaaaacaa acttaaaatc atttatcaat ttgaacaaca aagcttggcc 2820

gaatgctaag agcttaaaaa tggcttcttt tgtttctttt tgttgcaaac ggtggagaga 2880

agagggaaat gaagattgac catatttttt tattatgttt taacatataa tattaataat 2940

ttaatcataa ttatactttg gtgaatgtga cagtggggag atacgtaaag tattttaaca 3000

ttatactttt tgcaagcagt tggctggtct acccaagagt gatcaaagtt tgagctgcct 3060

tcaatgagcc aatttttgcc cataatggat aaaggcaatt tgtttagttc aactgctcac 3120

agaataatgt taaaatgaaa ttaaaataag gtggcctggt cacacacaca aaaaaaaact 3180

aatgttggtt ggttgaattt tatattacgg aatgtaatat tatattttaa aataaaatta 3240

tgttatttag attcttaata ttttggagca ttccatacta taatttcgta acataatatt 3300

aaaatatagt aatataaagt gtaattaact ttaaattaca agcataatat taaattttga 3360

atcaattaat ttttatttct attattttaa ttaatttagt ctatttttc aaaataaaat 3420

ttaaatctaa ataaaaataa tttttcctta atgttgaaac aactcatgtt atacttcaaa 3480

attataagta ttatatttac cttgatgatt tatttattag tatattaatt ctgattataa 3540

600

ttatggtggg atacaatcgc tttccactaa atattttaac tatgatttat aaatttattt 3600

caacatcgta tatttactta ttaatacata atttatcata attttatgga aattgagacc 3660

aagaaacatt aagagaacaa attctataac aaagacaatt tagaaaaaaa tgtactttta 3720

ggtaatttta agtactctta accaaacaca aaaattcaaa tcaaatgaac taaataagat 3780

aatataacat acggaacatc ttacttgtaa tcttacattc ccataatttt attatgaaaa 3840

ataatcttat attactcgaa ctaaatgttg tcacaaatta ttatctaaat aaagaaaaac 3900

acttaatttt tataacattt tttcatatat ttgaaagatt atattttgta tatttacgta 3960

aaaatatttg acatagattg agcaccttct taacataatc ccaccataag tcaagtatgt 4020

agatgagaaa ttggtacaaa caacgtgggg ccaaatccca ccaaaccatc tctcattctc 4080

tcctataaaa ggcttgctac acatagacaa caatccacac acaaatacac gttcttttct 4140

ttctatttga ttaaccatgg ctcatagcat tcgtcaccct ttcttccttt tccaactttt 4200

actcataagt gtctcactag tgaccggtag ccacactgtt tcggcagcgg ctcgacgttt 4260

attcgagaca caagcaacct catcagagct cccacaattg gcttcaaaat acgaaaagca 4320

cgaagagtct gaatacgaaa agccagaata caaacagcca aagtatcacg aagagtactc 4380

aaaacttgag aagcctgaaa tgcaaaagga ggaaaaacaa aaaccctgca aacagcatga 4440

agagtaccac gagtcacacg aatcaaagga gcaaaaagag tacgagaaag aaaatctcga 4500

cgggcccgaa gatcttcgct agccgtcgac gcccggggga attcgtcgag ccttgaatca 4560

tatgacgctg gtgcatgtgc catcatcatg cagtaatttc atggtatatc gtaatatata 4620

gttaataaaa aagatggtga ttgggaaatg tgtgtgtgca ttcctccatg cactaatggt 4680

gaatctcttt gcatacatag aaattctaaa tggttatagt ttatgttata gtgtatgttg 4740

tagtgaaakt aattttaaat gttgtatcta atgttaacat cacttggctt gatttatgtt 4800

atgttatgta ttttacttta atgatattgc atgtattgtt aatttaacat tgcttgatca 4860

ttatactctt ctactattaa ttataaatgg cactgttttg tttaaacttt ttacaagtta 4920

agacatgtat aaatatatga caatataatt acaagtttta gttcaatgtt agctatctta 4980

Lel

gtatgttatt gatgatctta attacattta aacaaattcc acttaaaatt ttaataaata 5040

ataacaaata attattgtaa tataatacat taaatgcaac aaaaaatgaa ataaataaaa 5100

taaaatagca aataattgtt ataatattgt aatataatat gtaccatatt cttaactgaa 5160

atagggtcta acctataatc cctaaaattt cagtttaaat atttttatac ctgccatatt 5220

attagaactc tttttaaata tattaaaatt ttaattatac caatttaatt taaactatta 5280

attatcttaa ctaaaatcta aaattttatt taacctatta attaaattcc taattatctt 5340

atctaattta aaactctaat tatcctaatt tgatttaaat tcttgattat cttaatttgt 5400

aacctcctcc acccagctag atgctggacc cgaatccggg agattacatc ggcattgaga 5460

tggcctagta gtgatcaggg ttttctagag gtacccaatt cgccctatag tgagtcgt 5518

<210> 12
<211> 910
<212> DNA
<213> Gossypium Hirsutum

<400> 12
aaaaaacaat gagcactgca agatttatca agtgtgtcac ggtcggtgat ggagctgtgg 60

ggaaaacttg tatgctcatt tcatatacca gcaatacttt cccaacggat tatgttccaa 120

cagtatttga taactttagt gccaatgtgg tggtggatgg cagcacagtg aaccttggcc 180

tatgggacac tgccgggcaa gaagattata ataggctaag gccactgagt tatagaggag 240

ctgatgtgtt tttgttggcc ttttctctta taagcaaggc cagttatgaa aacatctaca 300

aaaagtggat cccagagcta agacattatg ctcataatgt accagttgtg cttgttggaa 360

ccaaactaga tttgcgagat gacaagcagt tcctcattga tcaccctgga gcaacaccaa 420

tatcaacatc tcagggagaa gaactaaaga agatgatagg agcagttact tatatagaat 480

gcagctccaa aacccaacag aatgtgaagg ctgttttcga tgctgcaata aaagtagctt 540

tgaggccacc aaaaccaaag agaaagcctt gcaaaaggag aacatgtgct ttcctttgaa 600

tattggatca ttattacagt caaaaacagt taacaaaagc tgttgcagat aaacactgaa 660

tctgctatag tttgtttttg gtttacatat gttccacgtg aaactatgaa gcatctctaa 720

gaaaacccaa actatcatat caacccatcg atcaatgaat cgatttcaat tttcgcagta 780

taagttcctt ttaatccttt ctttttactt cattttataa cgaattctat ggataatgtt 840

ccctacaaac atgtcattac aatgtttaat tataaattcc attcttctat tttactaaaa 900

aaaaaaaaaa 910

<210> 13
<211> 910
<212> DNA
<213> Gossypium Hirsutum

<220>
<221> CDS
<222> (9)..(596)

<400> 13
aaaaaaca atg agc act gca aga ttt atc aag tgt gtc acg gtc ggt gat 50
Met Ser Thr Ala Arg Phe Ile Lys Cys Val Thr Val Gly Asp
1 5 10

gga gct gtg ggg aaa act tgt atg ctc att tca tat acc agc aat act 98
Gly Ala Val Gly Lys Thr Cys Met Leu Ile Ser Tyr Thr Ser Asn Thr
15 20 25 30

ttc cca acg gat tat gtt cca aca gta ttt gat aac ttt agt gcc aat 146
Phe Pro Thr Asp Tyr Val Pro Thr Val Phe Asp Asn Phe Ser Ala Asn
35 40 45

gtg gtg gtg gat ggc agc aca gtg aac ctt ggc cta tgg gac act gcc 194
Val Val Val Asp Gly Ser Thr Val Asn Leu Gly Leu Trp Asp Thr Ala
50 55 60

ggg caa gaa gat tat aat agg cta agg cca ctg agt tat aga gga gct 242
Gly Gln Glu Asp Tyr Asn Arg Leu Arg Pro Leu Ser Tyr Arg Gly Ala
65 70 75

gat gtg ttt ttg ttg gcc ttt tct ctt ata agc aag gcc agt tat gaa 290
Asp Val Phe Leu Leu Ala Phe Ser Leu Ile Ser Lys Ala Ser Tyr Glu
80 85 90

aac atc tac aaa aag tgg atc cca gag cta aga cat tat gct cat aat 338
Asn Ile Tyr Lys Lys Trp Ile Pro Glu Leu Arg His Tyr Ala His Asn
95 100 105 110

```
gta cca gtt gtg ctt gtt gga acc aaa cta gat ttg cga gat gac aag   386
Val Pro Val Val Leu Val Gly Thr Lys Leu Asp Leu Arg Asp Asp Lys
                115                 120                 125

cag ttc ctc att gat cac cct gga gca aca cca ata tca aca tct cag   434
Gln Phe Leu Ile Asp His Pro Gly Ala Thr Pro Ile Ser Thr Ser Gln
            130                 135                 140

gga gaa gaa cta aag aag atg ata gga gca gtt act tat ata gaa tgc   482
Gly Glu Glu Leu Lys Lys Met Ile Gly Ala Val Thr Tyr Ile Glu Cys
        145                 150                 155

agc tcc aaa acc caa cag aat gtg aag gct gtt ttc gat gct gca ata   530
Ser Ser Lys Thr Gln Gln Asn Val Lys Ala Val Phe Asp Ala Ala Ile
    160                 165                 170

aaa gta gct ttg agg cca cca aaa cca aag aga aag cct tgc aaa agg   578
Lys Val Ala Leu Arg Pro Pro Lys Pro Lys Arg Lys Pro Cys Lys Arg
175                 180                 185                 190

aga aca tgt gct ttc ctt tgaatattgg atcattatta cagtcaaaaa          626
Arg Thr Cys Ala Phe Leu
                195

cagttaacaa aagctgttgc agataaacac tgaatctgct atagtttgtt tttggtttac 686

atatgttcca cgtgaaacta tgaagcatct ctaagaaaac ccaaactatc atatcaaccc 746

atcgatcaat gaatcgattt caattttcgc agtataagtt ccttttaatc ctttcttttt 806

acttcatttt ataacgaatt ctatggataa tgttccctac aaacatgtca ttacaatgtt 866

taattataaa ttccattctt ctattttact aaaaaaaaaa aaaa                  910


<210> 14
<211> 196
<212> PRT
<213> Gossypium Hirsutum

<400> 14
Met Ser Thr Ala Arg Phe Ile Lys Cys Val Thr Val Gly Asp Gly Ala
  1               5                  10                  15

Val Gly Lys Thr Cys Met Leu Ile Ser Tyr Thr Ser Asn Thr Phe Pro
            20                  25                  30
```


104

Thr Asp Tyr Val Pro Thr Val Phe Asp Asn Phe Ser Ala Asn Val Val
35 40 45

Val Asp Gly Ser Thr Val Asn Leu Gly Leu Trp Asp Thr Ala Gly Gln
50 55 60

Glu Asp Tyr Asn Arg Leu Arg Pro Leu Ser Tyr Arg Gly Ala Asp Val
65 70 75 80

Phe Leu Leu Ala Phe Ser Leu Ile Ser Lys Ala Ser Tyr Glu Asn Ile
85 90 95

Tyr Lys Lys Trp Ile Pro Glu Leu Arg His Tyr Ala His Asn Val Pro
100 105 110

Val Val Leu Val Gly Thr Lys Leu Asp Leu Arg Asp Asp Lys Gln Phe
115 120 125

Leu Ile Asp His Pro Gly Ala Thr Pro Ile Ser Thr Ser Gln Gly Glu
130 135 140

Glu Leu Lys Lys Met Ile Gly Ala Val Thr Tyr Ile Glu Cys Ser Ser
145 150 155 160

Lys Thr Gln Gln Asn Val Lys Ala Val Phe Asp Ala Ala Ile Lys Val
165 170 175

Ala Leu Arg Pro Pro Lys Pro Lys Arg Lys Pro Cys Lys Arg Arg Thr
180 185 190

Cys Ala Phe Leu
195

<210> 15
<211> 3045
<212> DNA
<213> Gossypium Hirsutum

<400> 15
ttggatgaga accaattttt aatagtaaan cctaaccaat ttttaataat aaagctgact 60

cctagtacaa gagcttttat tcattcttct attttgcttt cctctaggct tggcaatcga 120

gaattttctt gtgttacaat ataataaata catcgtagaa ataaatttta ttcaaattga 180

agtcttaacc atctttaata tttgtagatg taatttaaat gaaagataaa tacatattct 240

tggacatgta ttttcatctt aatgtttgtg gctttggtga taggtgtatt gatgtacgat 300

gtcttttaaa tcacatatca cattttgagt ttgtatgatg ataagtcgac ataancgaaa 360

tatggtgtga tcttcacttt tgaactttga taagtcacca aactttaaca aagtttgatt 420

gtgtacatat atatatatat cttcaaattt tataataaaa attgtgttta aataatttac 480

agttatatta ttttttatc tctaatttta tttgtcgcca aatttttagt tgatatttta 540

acataaaaaa aattgtacac atttacaagc ccatatacaa ataattatat aaatattcat 600

taaaaaatat atttaaatat aggatataaa tataactatt ttagaattat tctactttaa 660

gataacatag gttaaatgta taattaataa ggttagttta ttgtaaagat gagtatatat 720

gtcgtaaaca taatcactaa ccatttttat taacttcttg gttttgaagt tccaaaaaga 780

aaatggaagg gaaatttgag agtaagttca tgtttatatt atacataatg aagttgatgt 840

tttcttcttt ttaatatttt tatacaaaat atttaaataa aataattaag gattgaatga 900

aaaatataat gaaagtcgtt ttactaatag tcatattgca ttttgtcgca tctacttaaa 960

taatagataa attaattgtg gtacattaga tcaaagaaca aactagattt tgtcccattc 1020

tattgttaaa agctggtccg tttacattaa aataaggtac atgttacatg ccacgtataa 1080

ctatctggtt attctatcaa tcacgctaat ttttaacagt agaaatgaat gtaattttta 1140

aatagaaagg gtcaaattgt tatttgatct aacacgtagg gattaattta cttattttcc 1200

taaagaaata agtaaaatat aatttgaatc ttaatacaaa aactttcatg atacttttat 1260

catattttac ttataattta atattgtgag agtaacaaar ttaaaaaaca tagaaacacc 1320

aaaagttagt tatggtgtga ctcatataca cagttaaaat ttgaataaat ttttttcttc 1380

gtcattaatt ccatcatggg ttttttttt tctagttaag ccataattat caaaataatc 1440

atcattaatc ctatcaatac cccgccctgc ctccctccct caatacttaa acccaactaa 1500

cacccagcac caaacgcact ttaatagcca cctatttcta gccatgtcct tgcacttaaa 1560

gaaaagtaaa gctaacctgc aatcattcca tatcgaggcc tcaacagata aagttggttg 1620

atgggtttgc accaagttgt taaaacccgg ccctcaactt ccctttttctt ttcatcctcc 1680

ccactccaca ccctccaatt ttcttcatat ggttctatta taagttcttt ataatcacag 1740

aatcaagata agtcctcagc aaacaaaaaa ccatggctct cgagcaagat ctggactagt 1800

cagagctctg aatattggat cattattaca gtcaaaaaca gttaacaaaa gctgttgcag 1860

ataaacactg aatctgctat agtttgtttt tggtttacat atgttccacg tgaaactatg 1920

aagcatctct aagaaaaccc aaactatcat atcaacccat cgatcaatga atcgatttca 1980

attttcgcag tataagttcc ttttaatcct ttctttttac ttcattttat aacgaattct 2040

atggataatg ttccctacaa acatgtcatt acaatgttta attataaatt ccattcttct 2100

attttactaa gatattagta acttcaaact gctgattttt actaatttat tatttataaa 2160

ttgttagaat gattattttt caataattta acaacaatat ttaatattat tattattatt 2220

atttctcaat ttttattaaa caaaaacata aatttttgac aaattaaaat aaatgaatta 2280

atttctcaat ttttcgtgca actattacaa aaatccttca tagtcctaat cttaatttga 2340

tgcagaggtg ataataatct taatttgatg cagaggtaat aatgggccgg gtttgagctg 2400

gacttaagca tgatattgac gtactttata tttttccaaa ttcaacccag ctcgaaatat 2460

gagtctaaaa ttttgtccaa tttaatccaa gcccatttta agttcgtcca tattattttt 2520

taatttaaaa aatttatatc attttatttt aatatttaat tattttatat atttttttatt 2580

tattgaaaat ttttatatag tcatcttaac attatgttaa tgtttatatt agagtagtat 2640

tatatatatt tagtataggt ttattttgtt aataaactta aaaatgggtc ttgtgggcta 2700

gacttggacc ttaaatgctc aaactcaaac ttaattcata ttttaaacag gcttaatatt 2760

tttatttaca ctgtttcaaa tttttcgggt gaaatatctt cgagtctaga ttaataacac 2820

cacaggtcta atttgatgct caatgaaaat gaaatcatat tgagcttaat taatattcca 2880

ttcttctttg ctgaaaggac caagcaattc gagttacatt aaggttaaag agtatgggat 2940

ccgccaaacc tgccccaatg tctcttcaac catccaaaaa cttgagtcag tatcacatac 3000

atgtaccgnt atttatttat ttattgaaat tggcattatt tcttg 3045

<210> 16

<211> 1871
<212> DNA
<213> Gossypium Hirsutum

<400> 16
gggcattcca cacgaccatg tgtcccctat ttccaggcat tttgagactt cacctaaact 60

tctagagttg tttcaaatta gcccctattt gttcttaaat cattttagga tcttgtaaac 120

tcgtatttag gactaaatgt gtaatttata ctttaattat gattgattaa ttgattgatt 180

tngtagtaat gcccgtgacc ctaatccgtt agcgaagagg ggttaggggt taggggtttt 240

attattattt tttagatatt gtataactct tgttttattt ttaattttgt tactatttca 300

aaggcatttg tttgtagtgt tatttcgagt aggttttatg ggtgaacaac ccttgaccgc 360

caaatcaatc acaagagttc aacattttat ttattttgaa atgtattaaa aatcgttaat 420

ctatatattc gccccattat tgggattaaa tattcacaag ggtttagacc gtcatgagac 480

agattagttt tatcttactg atggtcacat cacaatagta attcaactta atacgagagg 540

aaccattgat tcacgcaatt ggtcatcgca cttagttgaa aagctagggg tgcgaagcta 600

ccgtacgctg gattatgatt gaacacctct aagtcagaat ccgaattaga aacaatgcac 660

gtgtccgttg cctgattgcc aaccccaata acacgtgttg taggtttaac catgtttatg 720

aaagataagg ttttttttt tataagcaag caactatagg ggtttacttc cgtgcgcaaa 780

tttttaggtt acctattttg ggaggggga ttatgattca agtgaaagaa agttggcaca 840

cacacaatca gtacatctgt tttgacagag acacagccta aaaacagcag caaacaagcc 900

taaaggaatc acccaaaaac aacaaccaaa agtacagagg aaaacaaaag aatccctgtt 960

accaccaagc tgaaaaaaag aaaataaaac tcaacttttg gcaataaaaa ccctcctacc 1020

ctcaacccct aaccacgcaa caatcagcaa tactccaagc aaccattttc cttacaagtt 1080

tgtttttctt gtgattaatc catatggcta gctccatgtc ccttaagctt gcatgtctgc 1140

tagtgttgtg catggtggtg ggtgcacccc tggctcaagg ggacgtaacc cgtgctgatg 1200

gcgtagtcac ccttccacgc tgccttcctt tattgatagg gaatggtaat ggtgctgatg 1260

ctgatgttga tgccccagct tgctgcgaca tcgtcagggg tctcttgagc tcgctgctct 1320

108

gtggtggtgt ttaggaaccg atctagcttg aaatcgggtt cggatacggg tggagtttca 1380

aattggtgtg ttatggaatc ccaacttaat cgtgtttagg ggtgggatcc aattgtgtga 1440

tacattacag agcatggttg tggattgttt tctcatatgt tttgattgac ttgcttgata 1500

cattggatga ttcgataagg tgaccggttt acctgggtat ccaaccatca tccgattact 1560

ttttaataat tatttgtttc ttctttatgt tgtctgtctt tttgtttctt gatctataac 1620

attatatttg cccaaatttt cgcattttcc atatgtagct tatatatgta tatatatatt 1680

caataaagta tattgattta gcagatgatt tgtgtatata tttaaatcaa atcaaacatt 1740

aatgatcatt cactagcgtc ttaatcttga aaaattcatc aacggttatc ctttgcagca 1800

tatataaaaa aaattgccaa ccctatgctt ttacacctaa ttcaagggat aacataagtc 1860

gattaaaacg a 1871

<210> 17
<211> 1871
<212> DNA
<213> Gossypium Hirsutum

<220>
<221> CDS
<222> (1104)..(1331)

<400> 17
gggcattcca cacgaccatg tgtcccctat ttccaggcat tttgagactt cacctaaact 60

tctagagttg tttcaaatta gcccctattt gttcttaaat cattttagga tcttgtaaac 120

tcgtatttag gactaaatgt gtaatttata ctttaattat gattgattaa ttgattgatt 180

tngtagtaat gcccgtgacc ctaatccgtt agcgaagagg ggttaggggt taggggtttt 240

attattattt tttagatatt gtataactct tgttttattt ttaattttgt tactatttca 300

aaggcatttg tttgtagtgt tatttcgagt aggttttatg ggtgaacaac ccttgaccgc 360

caaatcaatc acaagagttc aacattttat ttattttgaa atgtattaaa aatcgttaat 420

ctatatattc gccccattat tgggattaaa tattcacaag ggtttagacc gtcatgagac 480

609

agattagttt tatcttactg atggtcacat cacaatagta attcaactta atacgagagg 540

aaccattgat tcacgcaatt ggtcatcgca cttagttgaa aagctagggg tgcgaagcta 600

ccgtacgctg gattatgatt gaacacctct aagtcagaat ccgaattaga aacaatgcac 660

gtgtccgttg cctgattgcc aaccccaata acacgtgttg taggtttaac catgtttatg 720

aaagataagg ttttttttt tataagcaag caactatagg ggtttacttc cgtgcgcaaa 780

tttttaggtt acctattttg ggaggggga ttatgattca agtgaaagaa agttggcaca 840

cacacaatca gtacatctgt tttgacagag acacagccta aaaacagcag caaacaagcc 900

taaaggaatc acccaaaaac aacaaccaaa agtacagagg aaaacaaaag aatccctgtt 960

accaccaagc tgaaaaaaag aaaataaaac tcaacttttg gcaataaaaa ccctcctacc 1020

ctcaacccct aaccacgcaa caatcagcaa tactccaagc aaccattttc cttacaagtt 1080

tgtttttctt gtgattaatc cat atg gct agc tcc atg tcc ctt aag ctt gca 1133
Met Ala Ser Ser Met Ser Leu Lys Leu Ala
1 5 10

tgt ctg cta gtg ttg tgc atg gtg gtg ggt gca ccc ctg gct caa ggg 1181
Cys Leu Leu Val Leu Cys Met Val Val Gly Ala Pro Leu Ala Gln Gly
15 20 25

gac gta acc cgt gct gat ggc gta gtc acc ctt cca cgc tgc ctt cct 1229
Asp Val Thr Arg Ala Asp Gly Val Val Thr Leu Pro Arg Cys Leu Pro
30 35 40

tta ttg ata ggg aat ggt aat ggt gct gat gct gat gtt gat gcc cca 1277
Leu Leu Ile Gly Asn Gly Asn Gly Ala Asp Ala Asp Val Asp Ala Pro
45 50 55

gct tgc tgc gac atc gtc agg ggt ctc ttg agc tcg ctg ctc tgt ggt 1325
Ala Cys Cys Asp Ile Val Arg Gly Leu Leu Ser Ser Leu Leu Cys Gly
60 65 70

ggt gtt taggaaccga tctagcttga aatcgggttc ggatacgggt ggagtttcaa 1381
Gly Val
75

attggtgtgt tatggaatcc caacttaatc gtgtttaggg gtgggatcca attgtgtgat 1441

acattacaga gcatggttgt ggattgtttt ctcatatgtt ttgattgact tgcttgatac 1501

10

attggatgat tcgataaggt gaccggttta cctgggtatc caaccatcat ccgattactt 1561

tttaataatt atttgtttct tctttatgtt gtctgtcttt ttgtttcttg atctataaca 1621

ttatatttgc ccaaattttc gcattttcca tatgtagctt atatatgtat atatatattc 1681

aataaagtat attgatttag cagatgattt gtgtatatat ttaaatcaaa tcaaacatta 1741

atgatcattc actagcgtct taatcttgaa aaattcatca acggttatcc tttgcagcat 1801

atataaaaaa aattgccaac cctatgcttt tacacctaat tcaagggata acataagtcg 1861

attaaaacga 1871

<210> 18
<211> 76
<212> PRT
<213> Gossypium Hirsutum

<400> 18

```
Met Ala Ser Ser Met Ser Leu Lys Leu Ala Cys Leu Leu Val Leu Cys
  1               5                  10                  15

Met Val Val Gly Ala Pro Leu Ala Gln Gly Asp Val Thr Arg Ala Asp
             20                  25                  30

Gly Val Val Thr Leu Pro Arg Cys Leu Pro Leu Leu Ile Gly Asn Gly
         35                  40                  45

Asn Gly Ala Asp Ala Asp Val Asp Ala Pro Ala Cys Cys Asp Ile Val
     50                  55                  60

Arg Gly Leu Leu Ser Ser Leu Leu Cys Gly Gly Val
 65                  70                  75
```